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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
|-----------------|-------------|----------------------|---------------------|------------------|

10/718,777

11/21/2003

Andreas Kyck

PEK-IN-1257

1586

27346 7590 12/17/2007
LERNER GREENBERG STEMER LLP
FOR INFINEON TECHNOLOGIES AG
P.O. BOX 2480
HOLLYWOOD, FL 33022-2480

EXAMINER

NGUYEN, KIET TUAN

ART UNIT

PAPER NUMBER

2881

MAIL DATE

DELIVERY MODE

12/17/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/718,777

Applicant(s)

KYEK, ANDREAS

Examiner

Kiet T. Nguyen

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 November 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 and 34-54 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-12, 14-17, 19-24, 27-32, 34-39, 41-43, 45-48 and 50-54 is/are rejected.
- 7) ☒ Claim(s) 9, 13, 18, 25, 26, 40, 44 and 49 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

The final rejection mailed on 09-10-2007 is now withdrawn because applicant's remarks rebutting this rejection have been found to be persuasive.

Objected Informalities

The disclosure is objected to because of the following informalities:

In The Claims

Claim 1, line 10, "the walls" should be -- walls --.

Claim 1, line 11, "the surface" should be -- a surface --.

Claim 32, line 8, "the walls" should be -- walls --.

Claim 32, line 9, "the surface" should be -- a surface --.

Appropriate correction is required.

Rejection Under 35 U.S.C. 103(a)

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-8, 10-12, 14-17, 19-24, 27-32, 34-39, 41-43, 45-48 and 50-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seki et al. (6,043,499) or Matsuo Hisahide (JP 06 267 493) in view of Kushima Hiroyuki (JP 62 058 536).

Seki et al. (6,043,499) discloses, in figs. 1-7, an ion implantation apparatus. The apparatus includes an ion beam 1; a wafer 2; and a neutralizer 5 for producing secondary electrons, which includes a primary electrode 41 positioned transversely with

respect to a propagation direction of the ion beam 1 (see figs. 6-7) for producing primary electrons, an accelerating electrode 31 and an accelerating secondary electrode 42 having an aperture having parallel side surfaces and overlapped surfaces and producing secondary electrons 6a.

Matsuo Hisahide (JP 06 267 493) discloses, in the figure, an ion implantation apparatus using a neutralizer for neutralizing an ion beam or a target material. The apparatus includes an ion beam 2; a wafer 1; and a neutralizer which includes a primary electrode 3 positioned transversely with respect to a propagation direction of the ion beam 2 for producing primary electrons 11, and an electron multiplier element 12 for producing secondary electrons 21.

Seki et al. (6,043,499) or Matsuo Hisahide (JP 06 267 493) discloses all the features as discussed above except the walls of the at least one aperture extending obliquely to the surface of the secondary electrode as recited in claims 1 and 32; the direction of the aperture arranged at an angle of between 30 and 70 degrees with respect to a normal of the secondary electrode as recited in claims 7-8 and 38-39; the distance between 2 mm and 6 mm being between the side walls of the aperture as recited in claims 10-11 and 41-42; the secondary electrode made of aluminum, an aluminum alloy, AL 99, AL 99.9, an even purer aluminum, graphite, at least 60% by mass of graphite or aluminum oxide as recited in claims 14-17, 23-24 and 45-48; the acceleration electrode having at least 100 , 500 or 1000 openings as recited in claims 19-24; and the primary electrode arranged parallel to a propagation direction of the ion beam as recited in claims 30 and 53.

Kushima Hiroyuki (JP 62 058 536) discloses, in the figure, an electron multiplying element. The element is performed as an electrode by coating conductive materials and applying voltages thereon and includes a plurality of inclined through holes for producing secondary electrons, thus would have been obvious to one skilled in the art to use the electrode element having a plurality of inclined through holes in the Seki et al. (6,043,499) or Matsuo Hisahide (JP 06 267 493) apparatus for producing secondary electrons as Seki et al. (6,043,499) disclose the secondary electron generation plate for generating the secondary electrons from the primary electrons or Matsuo Hisahide (JP 06 267 493) discloses the electron multiplier element for generating the secondary electrons from the primary electrons.

Arranging the direction of the aperture at an angle of between 30 and 70 degrees with respect to a normal of the secondary electrode and the distance between 2 mm and 6 mm being between the side walls of the aperture are considered to be obvious variation in design, since directing an electron beam and the dimension of the electron beam are consisting of many means for treating an element, thus would have been obvious to one skilled in the art to arrange the direction of the aperture at an angle of between 30 and 70 degrees with respect to a normal of the secondary electrode and the distance between 2 mm and 6 mm being between the side walls of the aperture in the Seki et al. (6,043,499) apparatus for controlling electrons.

Making the electrode of AL 99, AL 99.9, an even purer aluminum, aluminum, or an aluminum alloy is considered to be obvious variation in design, since it well known in the art to use these material for making an electrode, thus would have been obvious to

one skilled in the art to use the material such as AL 99, AL 99.9, a purer aluminum, or an aluminum alloy for making an electrode in the Seki et al. (6,043,499) apparatus for producing secondary electrons.

Using the electrode having at least 100, 500 or 1000 openings, or the wire mesh having at least 100 holes or meshes is also considered to be obvious variation in design, since the number openings of the electrode or wire mesh are used to make the electron beam to be greater area, thus would have been obvious to one skilled in the art to use the electrode having at least 100, 500 or 1000 openings, or the wire mesh having at least 100 holes or meshes in the Seki et al. (6,043,499) apparatus for neutralizing the ion beam or the semiconductor substrate.

Arranging the primary electrode parallel to a propagation direction of the ion beam is considered to be obvious variation in design, since it is well known in the art to arrange the electrode parallel to a propagation direction of the ion beam as disclosed in the Fuzishita et al (4,916,311), thus would have been obvious to one skilled in the art to arrange the primary electrode parallel to a propagation direction of the ion beam in the Seki et al. (6,043,499) apparatus for neutralizing the ion beam or the semiconductor substrate.

Claims 9, 13, 18, 25-26, 40, 44 and 49 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Reasons for indicating allowable subject matter

The prior art fails to disclose an apparatus for producing secondary electrons, which includes an angle of the aperture direction defined by $\tan(90^\circ - w) = d/b$ as recited in claims 9 and 40; at least one of a plurality of aperture openings being at a different inclination angle than another one of the plurality of aperture openings as recited in claims 13 and 44; a secondary electrode having a mean surface roughness of between 5 and 8 μm as recited in claims 18 and 49; or an acceleration electrode having a mean surface roughness of less than that of the secondary electrode as recited in claim 25.

Applicant's arguments filed on 11-28-2007 have been fully considered but they are not persuasive in view of the foregoing reasons.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kiet T. Nguyen whose telephone number is 571-272-2479. The examiner can normally be reached on Monday-Friday 8-6.


The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Application/Control Number:
10/718,777
Art Unit: 2881

Page 7

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KN


KIET T. NGUYEN
PRIMARY EXAMINER